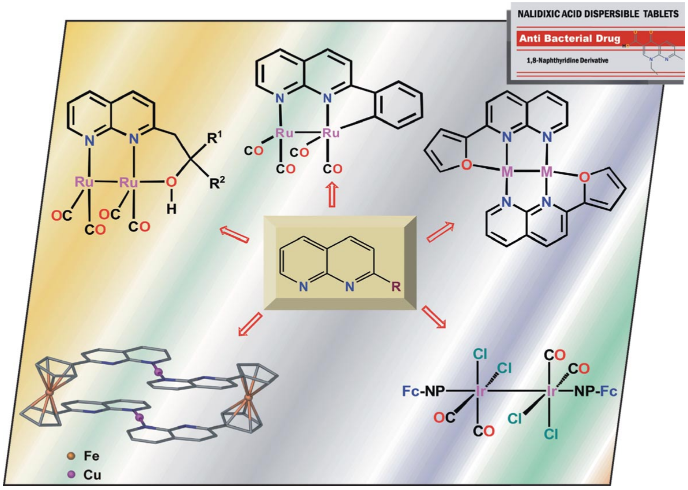
EurJIC
European Journal of Inorganic Chemistry

HUNGARY
ITALY
GERMANY
GREECE
BELGIUM
FRANCE
SWEDEN
CZECH REPUBLIC
AUSTRIA
PORTUGAL
SPAIN
NETHERLANDS

A union formed by chemical societies in Europe (ChemPubSoc Europe) has taken the significant step into the future by merging their traditional journals, to form two leading chemistry journals, the *European Journal of Inorganic Chemistry* and the *European Journal of Organic Chemistry*. Three further members of ChemPubSoc Europe (Austria, Czech Republic and Sweden) are Associates of the two journals.

COVER PICTURE

The cover picture shows various applications of naphthyridine derivatives (NP-R) in dimetal chemistry developed in our laboratory. The *cis*/*trans* isomerization of NP-R ligands on a quadruply bonded dimolybdenum(II) platform, axial modulation of the metal–metal bond in dimetal paddlewheel complexes, C–H bond activation and C–C bond formation at the axial site of the $[Ru_2(CO)_4]^{2+}$ core, the chemistry of ferrocene–naphthyridine hybrid ligands in accessing diiridium compounds and a host of mixed-metal compounds are described in the Microreview by J. K. Bera et al. on p. 4023ff. The multicolour background signifies the versatility of NP-R ligands in dimetal chemistry. The image at the top-right corner emphasizes the importance of naphthyridine derivatives in medicinal chemistry. A line drawing of nalidixic acid, the key ingredient of the anti-bacterial drug GramoNeg (Ranbaxy, India), is seen floating on the image. Contributions from the Design Program, IIT Kanpur and Dr. Nirmal Kumar, principal medical officer at IIT Kanpur, in the preparation of this cover picture are deeply appreciated.



CONTENTS

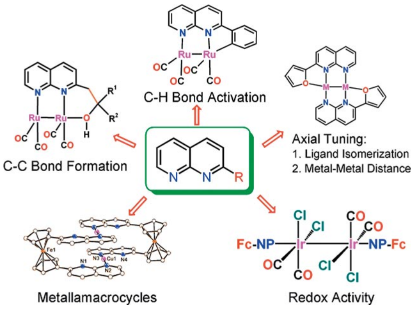
MICROREVIEW

Dimetallic Complexes

J. K. Bera,* N. Sadhukhan, M. Majumdar 4023–4038

1,8-Naphthyridine Revisited: Applications in Dimetal Chemistry

Keywords: Dimetals / Organometallics / Iridium / Self-assembly / N ligands



Recent applications of functionalized naphthyridine ligands (NP-R) in dimetal chemistry are highlighted.

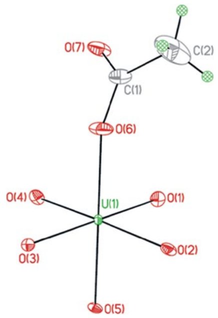
SHORT COMMUNICATION

Uranium Coordination Chemistry

S. Wu, J. Ling, S. Wang, S. Skanthakumar, L. Soderholm, T. E. Albrecht-Schmitt,* E. V. Alekseev,* S. V. Krivovichev, W. Depmeier 4039–4042

Uranium(VI) Adopts a Tetraoxido Core

Keywords: Actinides / Uranium / Oxido ligands / Hydrothermal synthesis / Solid-state reactions / Layered structure / Framework structure / Structure elucidation



The approximately planar tetraoxido core found in Np^{VII} and Pu^{VII} compounds is unique to the actinides. Here we show that this coordination environment occurs for the ubiquitous element uranium when found in the lower oxidation state of +6.

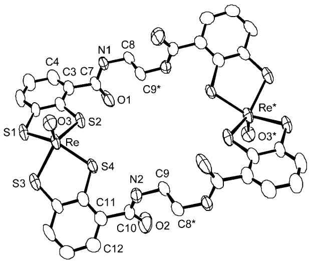
FULL PAPERS

Supramolecular Chemistry

J. S. Gancheff, R. Q. Albuquerque, A. Guerrero-Martínez, T. Pape, L. De Cola, F. E. Hahn* 4043–4051

A Dinuclear Double-Stranded Oxido Complex of Re^V with a Bis(benzene-*o*-dithiolato) Ligand

Keywords: Oxido complexes / Rhenium(V) / Double-stranded complexes

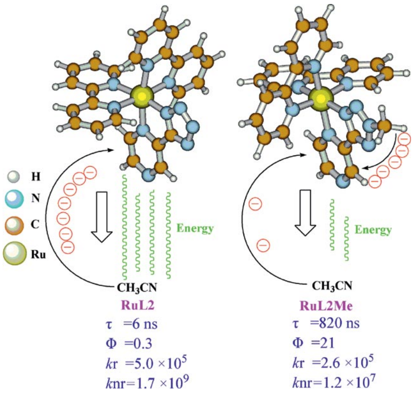


$[ReO(\mathbf{1})]_2^{2-}$

The reaction of $[ReOCl_3(PPh_3)_2]$ with 1,2-bis(2,3-dimercaptobenzamido)ethane (H_4-**1**) leads to the formation of a novel double-stranded dinuclear oxido Re^V complex: $[ReO(\mathbf{1})]_2^{2-}$. DFT calculations were performed to gain insight into the structural and electronic properties of the complex anion.

Polarity and Quantum Yields

The strong polarity of RuL2 is the main reason for a low quantum yield, as it can easily convey energy to the solvent through nonradiative pathways. An electron-donating CH_3 group in RuL2Me can greatly reduce this nonradiative process, which increases its quantum yield.



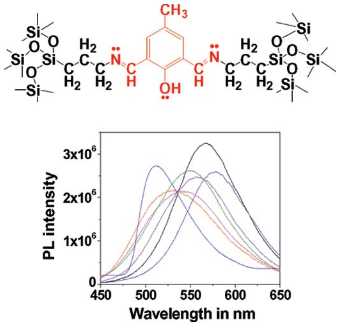
X.-N. Li, Z.-J. Wu, H.-J. Zhang,* Z.-J. Si, L. Zhou, X.-J. Liu ... 4052−4061

The Reasons for Ligand-Dependent Quantum Yields and Absorption Spectrum of Four Polypyridylruthenium(II) Complexes with a Tetrazolate-Based Ligand: TDDFT Study

Keywords: Ruthenium / Absorption / N ligands / Density functional calculations

Microporous Tunable Fluorophore

New supermicroporous luminescent organic-inorganic hybrid microporous material LHMM-1 containing a tunable fluorophore inside the framework has been synthesized in absence of any template and this material shows very strong sensing for metal cations like Fe^{3+}, Zn^{2+}, Cd^{2+} and Hg^{2+}.



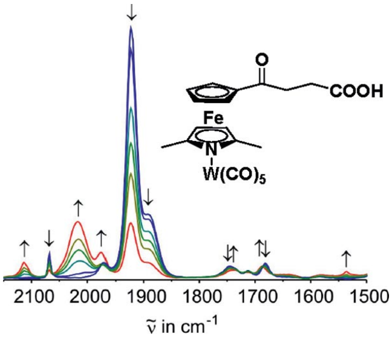
D. Chandra, A. Dutta, A. Bhaumik* .... 4062−4068

A New Organic-Inorganic Hybrid Supermicroporous Material Having Luminescence and Ion-Exchange Property

Keywords: Sensors / Fluorophore / Fluorescence / Ion exchange / Microporous materials / Organic-inorganic hybrid composites

Tungsten Azaferrocence Complexes

The synthesis and structure of 2,5-dimethylazferrocene carboxylic acids having IR-active $W(CO)_5$ markers is reported. Their FTIR spectroelectrochemical studies in OTTLE cell show that IR band shifts of the $W(CO)_5$ moiety are highly sensitive toward the 2,5-dimethylazaferrocene oxidation state.



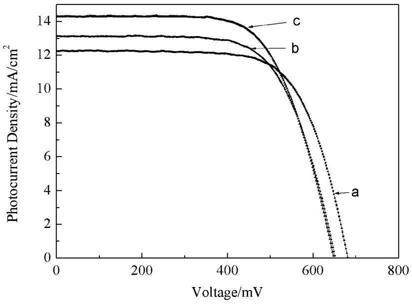
K. Kowalski,* R. F. Winter, A. Makal, A. Pazio, K. Woźniak .... 4069−4077

The Synthesis, Structure, and FTIR Spectroelectrochemistry of $W(CO)_5$ Complexes of 4-Oxo-4-(2,5-dimethylazaferrocen-1′-yl)-butanoic and 5-Oxo-5-(2,5-dimethylazaferrocen-1′-yl)pentanoic Acids

Keywords: Metallocenes / Cyclic voltammetry / IR spectroscopy / X-ray diffraction

Titania Nanostructures

Anatase rod-like nanocrystals and nanorings were prepared by a surfactant-free peptization−hydrothermal route, and the resulting TiO_2 has a high adsorption capacity for the ruthenium dye N719.



S. Li, Y. Li, H. Wang,* W. Fan, Q. Zhang* .... 4078−4084

Peptization−Hydrothermal Method as a Surfactant-Free Process toward Nanorod-Like Anatase TiO_2 Nanocrystals

Keywords: Nanostructures / Hydrothermal synthesis / Sol-gel processes / Crystal growth / Titanium

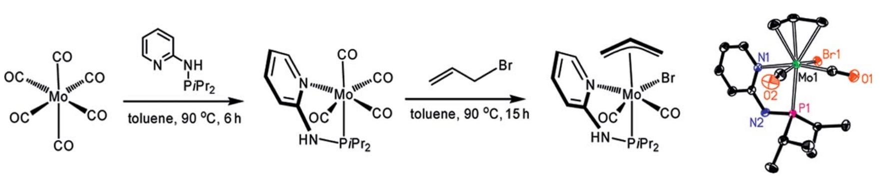
CONTENTS

Molybdenum Complexes

C. M. Standfest-Hauser, G. Dazinger, J. Wiedermann, K. Mereiter, K. Kirchner* 4085–4093

Molybdenum Carbonyl Complexes Bearing PN Ligands Based on 2-Aminopyridine

Keywords: Molybdenum / Carbonyl complexes / Phosphanes / Amines / Oxidative addition / Allyl ligands / Density functional calculations



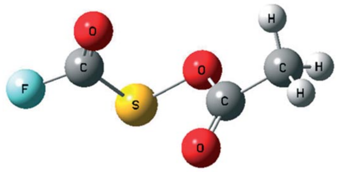
Mo complexes of the general formula $Mo(PN)(CO)_4$ containing both achiral and chiral P-N donor bidentate ligands based on 2-aminopyridine were prepared. The oxidative addition of allyl bromide to $Mo(PN)(CO)_4$ was studied with PN=N-2-amino-(diisopropylphosphanyl)pyridine (PN-*i*Pr). The mechanism of the oxidative addition was analyzed by DFT/B3LYP calculations.

Sulfenic Esters

M. Cuaquira Reina, C. O. Della Védova, S. E. Ulic,* H. Willner, H. Oberhammer 4094–4104

Spectroscopic Characterization and Conformational Properties of *S*-(Fluoroformyl)-*O*-(acetyl) Thioperoxide and *S*-(Fluoroformyl)-*O*-(trifluoroacetyl) Thioperoxide

Keywords: Sulfur / Matrix isolation / Pyrolysis / Vibrational spectroscopy / Conformation analysis / Quantum chemistry



syn-gauche-syn

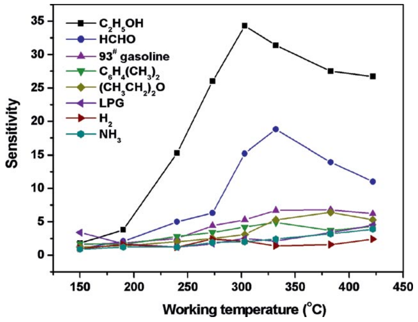
The conformational properties of sulfenic esters $FC(O)SOC(O)CH_3$ and $FC(O)SOC(O)CF_3$ were studied by vibrational spectroscopy and by theoretical calculations. Both gaseous compounds exhibit conformational equilibria at room temperature; the most stable form possesses *gauche* orientation around the S–O bond and synperiplanar orientation of both carbonyl groups with respect to the S–O bond (C_1 symmetry).

Nanocube Gas Sensors

Y. Cao, D. Jia,* J. Zhou, Y. Sun 4105–4109

Simple Solid-State Chemical Synthesis of $ZnSnO_3$ Nanocubes and Their Application as Gas Sensors

Keywords: Oxides / Nanostructures / Solid-phase synthesis / Sensors



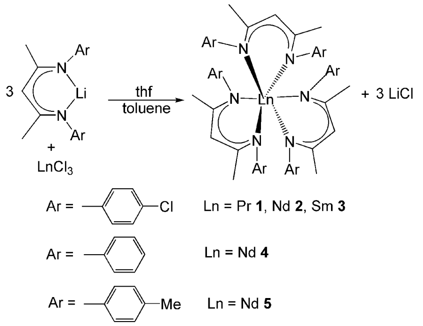
New $ZnSnO_3$ nanocubes were synthesized by a simple solid-state chemical reaction between metal salts and NaOH; this process is cheap and proceeds in a relatively simple manner. $ZnSnO_3$ nanocubes were found to possess good gas-sensing properties for ethanol and methanal; thus these materials may potentially be used as gas sensors.

ROP Catalysts

M. Xue, R. Jiao, Y. Zhang, Y. Yao, Q. Shen* 4110–4118

Syntheses and Structures of Tris-β-Diketiminate Lanthanide Complexes and Their High Activity for Ring-Opening Polymerization of ε-Caprolactone and L-Lactide

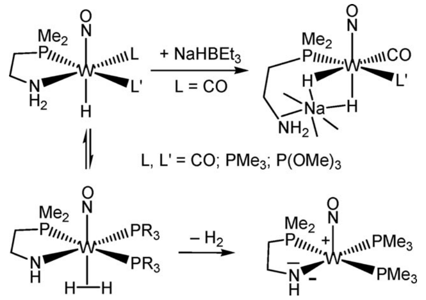
Keywords: Synthetic methods / Lanthanides / Lactones / Ring-opening polymerization / Metathesis



Tris-β-diketiminate lanthanide complexes and mono-β-diketiminate lanthanide dichlorides were synthesized and characterized. The high catalytic activity for the polymerization of ε-caprolactone and L-lactide shown by tris-β-diketiminate lanthanide complexes may be attributed to the activated Ln–β-diketiminate bond caused by the steric demand of the three β-diketiminate ligands.

Tungsten Hydride Complexes

Anionic nitrosyl tungsten dihydrides and neutral monohydrides with one or two acidic η^1- or η^2-(2-aminoethyl)dimethylphosphane ligands (edmp) were studied in solution as protonic–hydridic model systems. Complexes of the type $W(H)(edmp)(NO)L_2$ (L = phosphane, phosphite) underwent prototropic equilibration with the isomeric $W(H_2)(NHCH_2CH_2PMe_2)(NO)L_2$ species causing either H_2 release or H_W/H_N exchange.



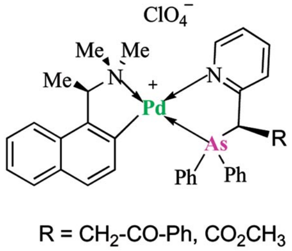
Z. Chen, I. Timokhin, H. W. Schmalle, T. Fox, O. Blacque, H. Berke* 4119–4133

Protonic–Hydridic Bifunctionality: The Protonic (2-Aminoethyl)dimethylphosphane Ligand in Nitrosyl Tungsten Hydride Complexes

Keywords: Hydride ligands / Structure elucidation / Tungsten / N,P ligands

Asymmetric Hydroarsanation

Optically pure keto- and ester-functionalized C-chiral pyridylarsane ligands were synthesized in high regio- and stereoselectivities via the asymmetric hydrophosphanation reactions using the organopalladium complex containing *ortho*-metalated (*R*)-[1-(dimethylamino)ethyl]naphthalene as the chiral reaction promoter.

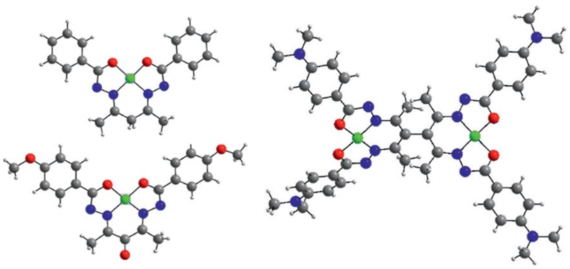


F. Liu, S. A. Pullarkat, Y. Li, S. Chen, P.-H. Leung* 4134–4140

Novel Enantioselective Synthesis of Functionalized Pyridylarsanes by a Chiral Palladium Template Promoted Asymmetric Hydroarsanation Reaction

Keywords: Asymmetric synthesis / Palladium / As ligands / Template synthesis

Nickel-Assisted Ligand Transformation



Pyrazolines derived from acetylacetone and 4-*R*-benzoylhydrazine and $Ni(O_2CCH_3)_2\cdot 4H_2O$ in boiling methanol provide Ni^{II} species, [Ni(H^{R}L)], [H$_3$^{R}L = acetylacetone bis(4-R-benzoylhydrazone)] (top left), while prolonged exposure of the reaction mixture to air provides a formally di-Ni^{III} species, [Ni(^{R}L–^{R}L)Ni] (right), which transforms, with H_2O/O_2, to a new Ni^{II} species, [Ni(^{R}LO)] (bottom left).

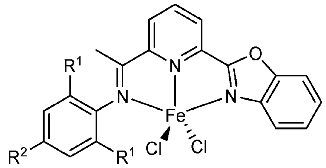
A. Mukhopadhyay, S. Pal* 4141–4148

Nickel-Assisted Oxidative C–C Coupling and Subsequent Cleavage to C=O of Active Methylene Group in a Tetradentate Ligand System: Di- and Mononuclear Complexes with Transformed Ligands

Keywords: Nickel / Ligand transformation / C–C coupling / Structure elucidation / EPR spectroscopy / Magnetic properties

Ethylene Oligomerization

Iron(II) complexes (Fe**1**–Fe**7**) ligated by 2-(2-benzoxazolyl)-6-[1-(arylimino)ethyl]pyridines showed moderate to good activities (up to ca. 10^6 g mol^{-1} Fe h^{-1} bar^{-1}) toward ethylene oligomerization and polymerization with high selectivity in forming vinyl-terminated oligomers or polyethylene waxes upon activation with modified methylaluminoxane.



R. Gao, Y. Li, F. Wang,* W.-H. Sun,* M. Bochmann 4149–4156

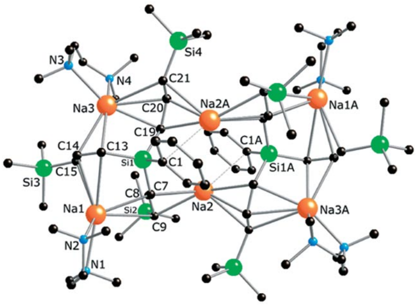
2-Benzoxazolyl-6-[1-(arylimino)ethyl]pyridyliron(II) Chlorides as Ethylene Oligomerization Catalysts

Keywords: Iron / N ligands / Oligomerization / Polymerization

CONTENTS

ansa-Tris(allyl) Complexes

Keywords: Allyl ligands / Lithium / Sodium / Potassium / Stereochemistry



The structure and stereochemistries of a series of silyl-substituted *ansa*-tris(allyl) complexes of lithium, sodium and potassium are dependent on the radius of the metal cation, the denticity of the co-ligands and the substituents on the silicon atoms.

* Author to whom correspondence should be addressed.

💻 Supporting information on the WWW (see article for access details).